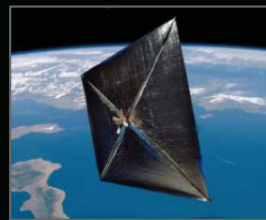
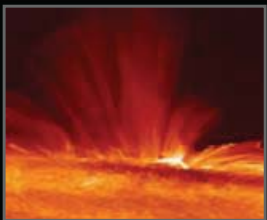




Marshall Space Flight Center

Presentation to Google

marshall



Marshall's Core Capabilities and Services



Space Transportation & Launch Systems



Propulsion Systems



Space Systems



Scientific Research

Transportation & Propulsion Systems

Exploration Vehicle Development



Space Launch System

- Program Management
- Stages
- Avionics
- Spacecraft & Payload Integration
- Advanced Development
- Boosters
- Engines

Orion

- Launch Abort System Motor Support

Technology Advancement



Advanced Exploration

- Nuclear Cryogenic Propulsion Stage
- Liquid Propulsion Systems

Space Technology

- Composite Cryogenic Propellant Tank
- Cryogenic Propellant Transfer/Storage

Industry & Defense Partnerships

Defense

- NIRPS
- SWORDS

Industry

- COTS Program & Partnerships
- CCDEV Program & Partnerships



Space Systems

Low-Earth Orbit



International Space Station

- Payload Ops Integration Center
- Payload Ops Integration Function
- Multi-use Payloads
- Materials Science Research Rack
- Microgravity Science Glovebox
- Environmental Control/Life Support
- ISERV
- Advanced Manufacturing Technology Demonstrations

Future Exploration

Life Support

- Atmosphere Resource Recovery
- Next-generation Life Support



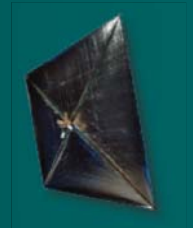
Destination Systems

- Mighty Eagle
- Lunar Mapping & Modeling
- Autonomous Systems
- Nuclear Systems



Technology Demo

- Technology Demonstration Missions
- Centennial Challenges



Solar System Universe

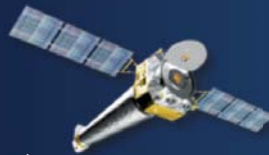
Astrophysics

Programs

- Chandra

Instruments

- HOPE/HEROES
- Fermi/GBM
- SRG/ART-XC (with Russia)



Research/Technology

- Advance Mirror Technology Demo

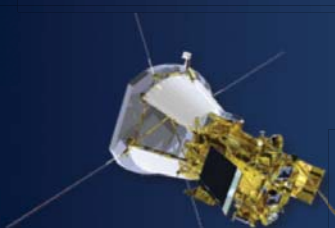
Test

- James Webb Mirror & COCOA Test

Heliophysics

Instruments

- Hinode/XRT
- Solar Probe Plus/SWEAP
- SUMI, Hi-C Suborbital



Earth Science

Instruments

- ISERV
- HIRAD
- LIS
- AMPR
- MAPIR

Selected Projects

- SPoRT
- SERVIR
- ACE
- Public Health
- Climate Dynamics



Planetary Science

Programs

- Discovery & New Frontiers



STO Organizational Structure

Mission: *Apply Marshall's unique capabilities to advance scientific understanding, knowledge application, and technical innovation, thus enabling a robust space economy and transformative exploration for the nation.*

Vision: *Marshall's Science and Technology organization will be a pre-eminent choice for delivering scientific and technical solutions as we reach for new heights and reveal the unknown for the benefit of humankind.*

Key Disciplines:



Astrophysics



Earth



Heliophysics



Planetary



Technology
Development
& Transfer

Earth Science Instruments

HIRAD (Hurricane Imaging Radiometer)

Flown on a WB-57 for the Hurricane & Severe Storm Sentinel (HS3) mission

ISERV (SERVIR Environmental Research and Visualization System)

Installed on ISS in 2012

Scheduled to be installed on ISS in 2015

LIS (Lightning Imaging Sensor)

NOTE: Other lightning instruments include TRMM LIS and LIP (Lightning Instrument Package)

AMPR (Advanced Microwave Precipitation Radiometer)

Flown on Earth Observing System (EOS) PM-1 platform

MAPIR (Marshall Airborne Polarimetric Imaging Radiometer)

Flown on multiple airborne suborbital platforms, and in partnership with U of Tennessee.

Earth Science Project Areas



SERVIR

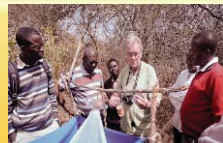
Uses a broad array of Earth-based satellite observations



Climate



Disasters



Health



Agriculture

Climate Dynamics

Advances understanding of climate variability on intra-seasonal (20–90 day) to near-decadal scales. Improves NASA climate model performance in quantifying and predicting these variations.

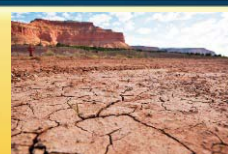


SPoRT (Short-term Prediction Research and Transition Center)

Uses multiple Earth-based satellite observations



Hurricanes



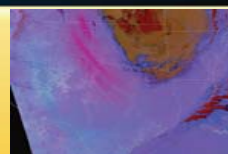
Drought



Tornadoes



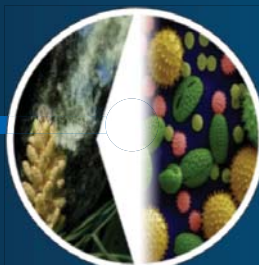
Soil Moisture



Weather

Public Health and Air Quality Programs

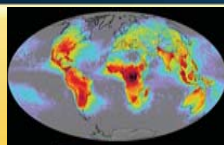
Uses data modeling and Earth-based satellite observations



Air Quality



Disease Vectors



Lightning NOx

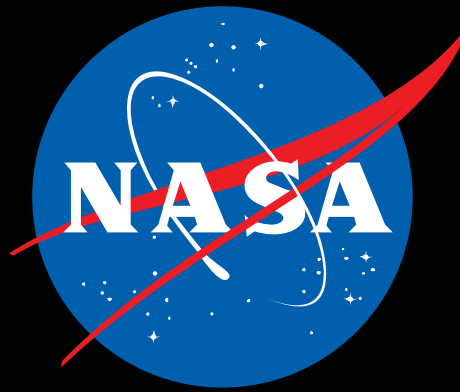
ACE (Arctic Collaborative Environment)

International partnership for information sharing to meet the challenges facing the Arctic



Working Together To Achieve
Greater Societal Benefits.





www.nasa.gov/marshall